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Procedia - Social and Behavioral Sciences 90 (2013) 356 – 364

Procedia
Social and Behavioral Sciences

6th International Conference on University Learning and Teaching (InCULT 2012)

Visual Art Education Teachers' Continuance Intention to Integrate ICT: A Model Development

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Abstract

Information and Communication Technology (ICT) integration has been a topic of discussion among scholars for over thirty years. Since it was first introduced, ICT has been increasingly being integrated at every level of educational system. As a subject that emphasizes creativity, innovation and critical thinking, Visual Art Education (VAE) teachers were urged to taking full advantage of ICT. The potential of ICT in promoting real world experiences through simulation, manipulation and creative expression should be applied, as these valuable approaches of teaching and learning arts have never been highlighted before in conventional arts classrooms. However, the success of ICT integration depends largely on factors that will eventually increase teachers' intention to continue using it. Based on that understanding, this study synthesized the Technology Adoption Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Expectation-Confirmation Model (ECM) in explaining and predicting the VAE teachers' intentions to continue using ICT in arts classrooms. A sample of 296 VAE teachers in Selangor, a state in Malaysia, took part in this study. Structural Equation Modelling (SEM) is used in testing the research hypotheses and validating the proposed model of the study. Results from the study demonstrate that teachers' perceived ease of use has the most significant direct effect on their continuance intention. A significant effect was also found in the relationship between teachers' perceived usefulness and social influences. Overall, these main factors explained 21.3 percent of VAE teachers' continuance intention to integrate ICT in arts classrooms. On the basis of these findings, the implications for theory development, practices and policymaking are discussed in this paper.

Selection and/or peer-review under responsibility of the Faculty of Education, University Technology MARA, Malaysia.

Keywords: Information and Communication Technology (ICT); Visual Art Education (VAE);

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doi:10.1016/j.sbspro.2013.07.103

1. Introduction

The rapid advancement of Information and Communication Technology (ICT) has offered substantial opportunities for the Visual Art Education (VAE) teachers to promote global, interactive and dynamic learning for students (Gregory, 2009). The advantage of integrating ICT in arts classrooms can be seen through its potential to promote a new way of perceiving and practising arts (Taylor, 2007). Apart from boosting students' creativity and critical thinking skills, the uniqueness of ICT will expand the VAE subject through a real problem solving and collaborative approach (Loveless, 2003). Realizing the importance of ICT in arts classrooms, this study will seek to determine factors that might influence Malaysian VAE teacher's continuance intention to integrate ICT. Although examining factors influencing technology integration has become a common goal among adoption researches, more in-depth research needs to be done, as it's varied and might be different for each context, subject area and teachers.

Like any other proposed technology, the successful adoption of ICT depends largely on long-term viability and users' intention to continue using it (Tervis & Economides, 2011). Adopted from the Expectation-Confirmation Model (ECM) (Bhattacherjee, 2001), the concept of continuance intention (CI) used to identify the changes in users' perception toward the proposed technology after using it. In light of the published research that highlight users' post-adoption (continued usage), especially in education context, the current study proposed a model in identifying factors that might influence the VAE teachers' CI to integrate ICT in arts classrooms. Five constructs namely perceived usefulness (PU), perceived ease of use (PEoU), social influences (SI), facilitating condition (FC) and attitude (ATT) are determined in the proposed model. These constructs were adopted from the Technology Adoption Model (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). Despite a number of researches that has been conducted to examine factors that might explain teachers' intention to continue using a proposed technology, few have developed a model to statistically explain the interaction among these factors. In addressing this issue, a model incorporating these factors was tested and developed. It was expected that this model would provide advice and guidelines for VAE teachers, school administrators and government administrators in the integration of ICT into VAE subject area.

2. Research Model and Hypotheses

Over the past three decades, numerous theoretical models have emerged to explore and explain factors that might influence users' acceptance toward a proposed technology. The TAM, UTAUT and ECM were chosen in forming a theoretical framework of the study owing to their suitability in predicting and explaining Malaysian VAE teacher's CI to integrate ICT. Five hypotheses associated with the constructs of the research model were then generated in determining the factors that might influence the Malaysian VAE teachers' continuance intention to integrate ICT in art classrooms.

2.1. Perceived Usefulness (PU)

PU, which refers to the degree a user believes that using a proposed technology would enhance his/her job performance (Davis, 1989), was found to have significant positive impact on their CI to integrate a proposed technology (viz. Lee, 2010; Ho, 2010). Users may continue to use a proposed technology if they believe that by using it will help them to gain more desired benefits (Bhattacherjee, 2001). In accessing student's intention to continue using web-based learning, the study by Chiu and Wang (2008) suggest that the more useful the student perceived the web-based learning, the more acceptable it would be perceived to be. Consistent with these findings, the first sub-hypothesis was formulated as:

H_1: The VAE teachers' PU has a significant influence on their CI to integrate ICT in arts classrooms

2.2. Perceived Ease of Use (PEoU)

PEoU is defined as the degree to which a user believes that using a proposed technology would be relatively free of effort (Davis, 1989). Strong evidences from previous research have posited PEoU as a direct determinant of user's CI to integrate a proposed technology (viz. Recker, 2010). The effect of PEoU on users' CI to integrate a proposed technology has also been confirmed through Hong et al. (2006) study. By adding PEoU into the original ECM framework, the explanatory of the model was increased by 17 percent. Based on the discussion above, the second hypothesis was stated as:

H_2: The VAE teachers' PEoU has a significant influence on their CI to integrate ICT in arts classrooms

2.3. Social Influences (SI)

SI is defined in this study as the degrees to which users' perceive that other important person believe that he or she should continue to use the proposed technology (Venkatesh et al., 2003). Inconsistence findings were reported by previous researches in assessing the relationship between user's SI and CI. Few studies did indicate a significant direct effect of SI toward user's CI (viz. Foucault & Scheufele, 2005). In contrast, a number of researchers found that user's SI has no significant effect on their CI (viz. Islam, 2011). The inconsistencies in those findings have lead to further investigation, thus this study proposed the next following hypothesis:

H_3: The VAE teachers' SI has a significant influence on their CI to integrate ICT in arts classrooms

2.4. Facilitating Conditions (FC)

FC refers to users' perception about the presence of control factors that might facilitate or hinder their performance of the behavior. A number of researches revealed that user's FC have significant effect on their CI to integrate a proposed technology (i.e. Chen & Li, 2010). In explaining students' intention to continue using e-learning, Lee's (2010) study found a significant direct effect toward their CI. Supportive environment, sufficient resources and continuous training were noted as constraints that influence their decision. With respect to those statements, it's very important to investigate factors that might block teacher's CI to integrate ICT.

H_4: The VAE teachers' FC has a significant influence on their CI to integrate ICT in arts classrooms

2.5. Attitude (ATT)

ATT is defined as individuals' positive or negative disposition toward integrating a proposed technology (Davis, 1989). Many studies have acknowledged ATT as one of the possible factor that influence users' CI to integrate the proposed technology (i.e. Chen, 2011). In predicting users' CI toward e-learning, Ho (2010) combined the TAM and the ECM. Analytical results of his study demonstrated that users' ATT has positively affected their CI. These previous findings led to the next hypothesis of the study:

H_5: The VAE teachers' ATT has a significant influence on their CI to integrate ICT in arts classrooms

2.6. Continuance Intention (CI)

Also known as the post-adaptation (Jasperson et al., 2005), the concept of CI has been described as confirmation. Emphasizing on users' long-term viability, CI is defined as the extent to which the VAE teachers' intention to continue integrate a proposed technology. Recognising the importance of CI, a number of studies have attempted to integrate CI in assessing users' continued usage of a proposed technology (i.e. Wu & Kuo, 2008). In explaining online banking customers' CI toward web-based applications, the study by Vatanasombut et

al. (2008) combined the TAM with the ECM. Based on this argument, the present study assumed that the higher the teachers' CI to integrate ICT, the more successful the integration process happen.

3. Research Methodology

Data of the present study were gathered through self-administrated online survey. Survey seemed to be the most appropriate method for data collection owing to its capability in determining the broad picture of teacher's CI to integrate ICT. In order to achieve a good response rate, teachers were contacted four times through a pre-notice letter, the survey questionnaire, a reminder or acknowledgement letter and replacement letter. The Partial Least Squares (PLS) of variance-based Structural Equation Modeling (SEM) was used to test the proposed model and research hypotheses of the study. As a technique that applied a multivariate statistical analysis, SEM was useful in representing translations of a series of hypothesized cause-effect relationship between predictor and predicted variables (Teo, 2011; Hair et al., 2010).

The VAE teachers in Selangor, Malaysia were identified as target participants of this study. There were a total of 887 VAE teachers who were serving in the National Secondary Schools in Selangor. The response rate of the study was 33.4 percent (296 respondents), which was quite acceptable for an online survey (Sekaran & Bougie, 2010). The questionnaire survey consisted of questions focusing on scales measuring the variables in the proposed model (Figure 1). All the item questions were adopted from the TAM, UTAUT and ECM questionnaires. This measure consisted of six questions respectively (Appendix A). A five-point Likert-type scale was employed, starting with SD = strongly disagree, D = disagree, U = undecided, A = agree and SA = strongly agree.

4. Research Findings and Results

Analysis of the data in this study was conducted in two phases: (1) the measurement properties; and (2) the structural model. The first phase examined the convergent validity and discriminate validity of the measurement items used in the study. The second phase was assessed to determine the contributions and the significance of the constructs.

4.1. Assessment of the Measurement Properties

The convergent validity was used in testing the stability and consistency of the survey items in measuring the constructs that designed to measure. In this study, the convergent validity was assessed by determining the Cronbach's alpha coefficient, composite reliability and the average variance extracted (AVE). The acceptable level of reliability coefficient was set to be greater than 0.7, while the composite reliability and the AVE was set at 0.7 and 0.5 respectively (Hair et al., 2010). Results from Table 1 indicate that all the reflective variables have met the recommendation.

Table 1. Cronbach's alpha coefficient, composite reliability and the AVE of constructs

Constructs	Cronbach's Alpha	Composite Reliability	AVE
Perceived Usefulness (PU)	0.88	0.91	0.63
Perceived Ease of Use (PEoU)	0.88	0.90	0.62
Social Influences (SI)	0.88	0.90	0.63
Facilitating Conditions (FC)	0.89	0.92	0.66
Attitude (ATT)	0.92	0.94	0.72
Continuance Intention (CI)	0.88	0.90	0.50

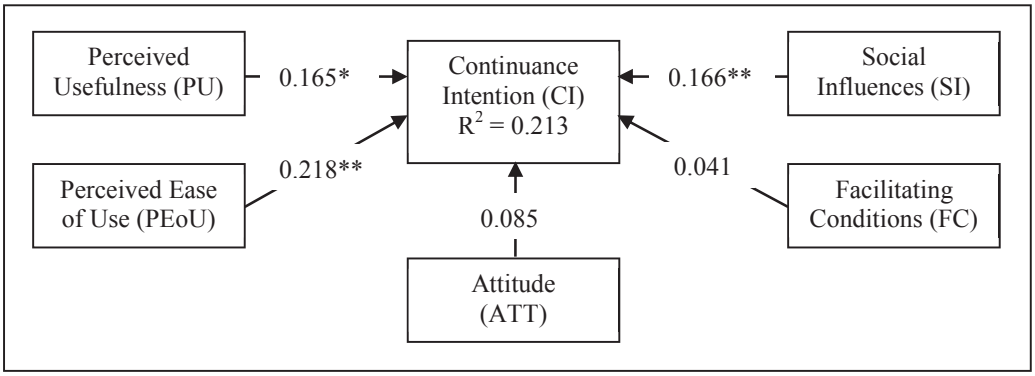
The discriminant validity was carried out to assess the degree to which items of a particular scale measure its own construct. In determining the discriminant validity of the measurement model, the square roots of the AVE should be larger than its correlation with other constructs (Hair et al., 2010). Referring to Table 2, all constructs have met the recommendation.

Table 2. Correlation of latent and square roots of AVE of constructs

Constructs	ATT	CI	FC	PEoU	PU	SI
Perceived Usefulness (PU)	*0.55*					
Perceived Ease of Use (PEoU)	0.30	*0.50*				
Social Influences (SI)	0.16	0.11	*0.65*			
Facilitating Conditions (FC)	0.41	0.38	0.09	*0.64*		
Attitude (ATT)	0.50	0.35	0.13	0.48	*0.63*	
Continuance Intention (CI)	0.27	0.30	0.29	0.36	0.28	*0.62*

4.2. The Structural Model and Tests of Hypotheses

The structural model was assessed to find out the explanatory power of the model and the significance of the path coefficients. The explanatory powers of the model were determined by calculating the coefficient of determination (R^2) of teachers' CI. As shown in Figure 1, the strongest direct impact on predicted constructs was between PEoU toward CI (B = 0.218, $p<0.01$). A significant direct impact was also found on the relationship between SI toward CI (B = 0.166, $p<0.01$) and PU toward CI (B = 0.165, $p<0.05$). Overall, three (H_1, H_2 and H_3) out of five hypotheses were supported by the data. The overall R^2 value of the model was 0.213, thus indicated that the model explained 21.3 percent of the variance of the VAE teachers' CI to integrate ICT.



*p<0.05, **p<0.01

Fig. 1. The Structural Model

5. Discussion

As anticipated, VAE teacher's PEoU was found to have the most influential factor in determining teachers' CI to integrate ICT. The result supports the view that individuals' perception of ease or difficulty toward integrating a proposed technology will mainly affect their future or continued usage (Bhattacherjee, 2001). From the direct influence, it is clear that when teachers perceive ICT to be easy; their intention to continue using it will be significantly increased. This finding is in parallel with previous research findings (cf. Sumak et al., 2011). Finding from the present study suggests that the Ministry of Education need to consider teacher's expectations before enforcements is made. Curriculum developer and courseware designer also need to reflect on teacher's potential when designing the curriculum and educational materials.

Finding from this study also revealed that VAE teachers' SI and PU have a significant positive effect on their decision to continue integrate ICT. Opinions and expectations from peers and superiors are the environmental factors that influence teachers' CI to integrate ICT. The significant effect on the relationship between teachers' SI toward CI may be due to the fact that ICT integration into classroom instruction in Malaysia is mandated by the government. VAE teachers' decision to integrate ICT was influenced by those who have authority to reward or punish their decision (Venkatesh et al., 2003). The findings from this study also imply that VAE teachers' understanding that ICT is useful will directly influence their CI to integrate it. It is reasonable to infer that teachers may continue to use ICT if they believe that by using it will help them to gain more desirable benefits.

Further, findings of the present study found that VAE teachers' FC and ATT did not significantly influence their CI to integrate ICT. These insignificant results are in line with previous research (cf. Teo & Schaik, 2012). Both teachers' FC and ATT were found to be important only in the early stages following the introduction of a proposed technology (Venkatesh et al., 2003). It could be argued that teachers in this study have been introduced to ICT since the last twenty years. VAE teachers' experiences have helped them to overcome factors that hinder their CI to integrate ICT in arts classrooms. Overall, the model accounted for 21.3 percent of the variance in Malaysian VAE teachers' decision to continue integrate ICT in arts classrooms. This result led to the conclusion that the collected data has represented the proposed model.

6. Conclusion

The present study investigated factors that might influence Malaysian VAE teachers' CI to integrate ICT in arts classrooms. It can be concluded from the findings that VAE teachers' PEoU was the most significant attribute that influence their CI. Significant direct effects are also found on the relationship between teachers' SI and PU

toward their CI. To facilitate teachers' CI to integrate ICT, attention should be given to their expectation and perception toward ICT. Teachers' perception on usefulness and ease of ICT use are dynamic and subject to situation influences. Authorities, such as the Ministry of Education and school administrations, need to understand their influence on teachers' CI to integrate ICT. Appropriate strategies need to be undertaken to keep teachers abreast with the advancement of the relevant technologies. By organizing relevant and continuous professional development courses, teachers will be more knowledgeable, skilful and confident toward continuing integrating ICT.

In addressing the issue of teachers' attitude and ease of use, the present study suggests the importance of mentoring system between senior and junior teachers. Senior teachers could be urged to lead and promote the use of ICT among other colleagues. Collaboration with other teachers is a pivotal element in teachers' professional development where they can share their experience, knowledge and reflection. Reviewing current curriculum and inclusion of comprehensive pedagogical content are also important strategies in producing cutting edge ICT mediated VAE teachers and students.

Acknowledgements

This study is part of the first authors' doctoral research. The authors would like to express their thanks to the colleagues at the Faculty of Education, Universiti Teknologi MARA (UiTM), School of Education, University of South Australia (UniSA) and the Malaysia Ministry of Education for assisting with data collection.

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Root Constructs, Definitions and Corresponding Items

Constructs	Definition	Items	Statement
Perceived Usefulness (PU) – Technology Acceptance Model (TAM) (Davis, 1989)	The extent to which the VAE teachers' believes that using ICT will influence their decision to integrate ICT in arts classrooms	PU1	Using ICT in my job would enable me to accomplish task more quickly
		PU2	Using ICT would improve my job performance as VAE teacher
		PU3	Using ICT would develop my students' creative expression
		PU4	Using ICT would increase my students' art production skills
		PU5	Using ICT would increase my students' motivation in learning VAE subject
		PU6	Using ICT would increase my students' access to research across the world
Perceived Ease of Use (PEoU) - Technology Acceptance Model (TAM) (Davis, 1989)	The extent to which the VAE teachers' believes that using ICT in arts classrooms will be free of physical and mental effort	PEoU1	Learning to operate ICT would be easy for me
		PEoU2	I would find it easy to get ICT to do what I want to do
		PEoU3	My interaction with ICT would be clear and understandable
		PEoU4	I would find ICT flexible to interact with
		PEoU5	I would be easy for me to become skill full at using ICT
		PEoU6	I would find ICT easy to use
Social Influences (SI) – Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)	The extent to which the VAE teachers' perceives that other important persons believe he or she should use ICT in arts classrooms	SI1	I need to integrate ICT to be seen as a good art teacher
		SI2	My students' encourage me to use ICT in arts classrooms
		SI3	My colleagues have encouraged me to integrate ICT in arts classrooms
		SI4	My students' parents encouraged me to integrate ICT in arts classrooms
		SI5	My school administrators has encouraged me to integrate ICT in arts classrooms
		SI6	State and government education department policies have encouraged me to integrate ICT in arts classrooms
Facilitating Conditions (FC) - Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)	The extent to which the VAE teachers' believes that organizations, infrastructure and policies exists in supporting them to integrate ICT in arts classrooms	FC1	I have sufficient resources to integrate ICT in arts classrooms
		FC2	Technical support is available for me to use ICT effectively
		FC3	The school administration of my school has been very supportive in the use of ICT in arts classrooms
		FC4	The state and federal education department policies have encouraged me to integrate ICT in arts classrooms
		FC5	To date, I feel I have been given many opportunities to develop my ICT skills
		FC6	VAE teachers have been well provided with ICT support

Attitude (ATT) - Technology Acceptance Model (TAM) (Davis, 1989)	The extent to which the VAE teachers' positive or negative feelings to integrate ICT in arts classrooms	ATT1	I have a lot of self-confidence when it comes to working with ICT
		ATT2	I am so confident about trying a new task on ICT
		ATT3	I love working with ICT
		ATT4	Once I start working with ICT, I find it hard to stop
		ATT5	I get nervous just thinking about having to teach with ICT
		ATT6	I feel anxious about having to learn new ICT skills
Continuance Intention (CI) – Expectation Confirmation Model (ECM) (Bhattacherjee, 2001)	The extent to which the VAE teachers' intention to continue integrate ICT in arts classrooms	CU1	I intend to use ICT more when teaching VAE
		CI2	I would like to continue using ICT for enhancing my personal knowledge
		CI3	I expect to continue using ICT for increasing my students' ability to produce digital artworks
		CI4	I intend to use ICT more for increasing my students' creativity and designing skill
		CI5	It is likely that I will continue using ICT for preparing effective teaching materials
		CI6	I intend to use ICT more for promoting quality teaching and learning in VAE